

WHAT IS CLAIMED IS:

1. A composite material comprising a metal matrix within which lamellar talc particles are distributed, characterized in that the talc particles carry, at their surface, a cellulose-derived compound attached by replacement of all or part of the hydroxyl groups.
- 10 2. The composite material as claimed in claim 1, characterized in that the metal matrix is composed of a metal chosen from Fe, Co, Ni, Mn, Cr, Cu, W, Mo, Zn, Au, Ag, Pb or Sn, of an intermetallic compound or an alloy of several metals chosen from the abovementioned metals, or of an alloy of one or more of said metals with a semimetal.
- 20 3. The composite material as claimed in claim 2, characterized in that the metal matrix is composed of nickel, a metal alloy of nickel with other metals or an alloy of nickel with a semimetal.
- 25 4. The composite material as claimed in claim 1, characterized in that the talc particles have a mean size of less than 15 μm .
- 30 5. A substrate carrying a lubricating coating, characterized in that the said coating is composed of the composite material as claimed in one of claims 1 to 4.
- 35 6. The substrate as claimed in claim 5, characterized in that it is composed of an intrinsically conducting material.
7. The substrate as claimed in claim 5, characterized in that it is composed of an insulating or semiconducting material, of which the surface to be treated has been rendered conducting by a

preliminary stage of metallization.

8. A process for the deposition on a substrate of a coating composed of a composite material comprising a metal matrix within which talc particles are distributed as lamellae, which consists in carrying out an electrolytic deposition using a solution of precursors of the metal matrix of the coating, characterized in that the solution of precursors additionally comprises talc particles in suspension, said talc particles having been modified beforehand at the surface by irreversible adsorption of a cellulose-derived compound by replacement of all or part of the hydroxyl groups.
9. The process as claimed in claim 8, characterized in that it is carried out by the chemical route by bringing the surface of the substrate to be coated into contact with the solution comprising the precursors of the metal matrix, the modified particles of talc and a compound which acts as catalyst for the oxidation/reduction of the precursors of the metal matrix of the coating.
10. The process as claimed in claim 8, characterized in that it is carried out by the electrochemical route in an electrochemical cell in which said substrate to be coated constitutes the cathode and the electrolyte is a solution of precursors of the metal matrix of the coating additionally comprising the modified particles of talc.
11. The process as claimed in claim 10, characterized in that the anode of the electrochemical cell is composed of the metal forming the matrix.
12. The process as claimed in claim 8, characterized in that the cellulose-derived compound is chosen from carboxymethylcellulose (CMC) and guar.

13. The process as claimed in claim 8, characterized in that the precursors of the metal matrix are chosen from complexed or noncomplexed ionic compounds which can be reduced in solution by the chemical route or by supplying electrons.

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14. The process as claimed in claim 8, characterized in that the treatment of the talc particles with the cellulose-derived compound (CDC) comprises the following stages:

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- preparation of a CDC aqueous mother solution (20 to 80 g.l⁻¹);
- preparation of a paste from demineralized water (100 ml), talc (50-150 g) and CDC (2-10 g) introduced from the CDC mother solution, homogenization being carried out with mechanical stirring (10-20 min);
- complete evaporation of the aqueous phase of the paste in an oven (50-90°C) until a dehydrated solid is obtained;
- deagglomeration of the dehydrated solid in order to obtain particles of treated talc having a particle size identical to that of the initial talc powder;
- first cycle: washing with demineralized water, centrifuging to separate the talc particles, evaporating the water in an oven and deagglomerating;
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- second washing/centrifuging/evaporating/deagglomerating cycle under the same conditions;
- sieving.

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